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## AN ARIZONA NATURAL BRIDGE.

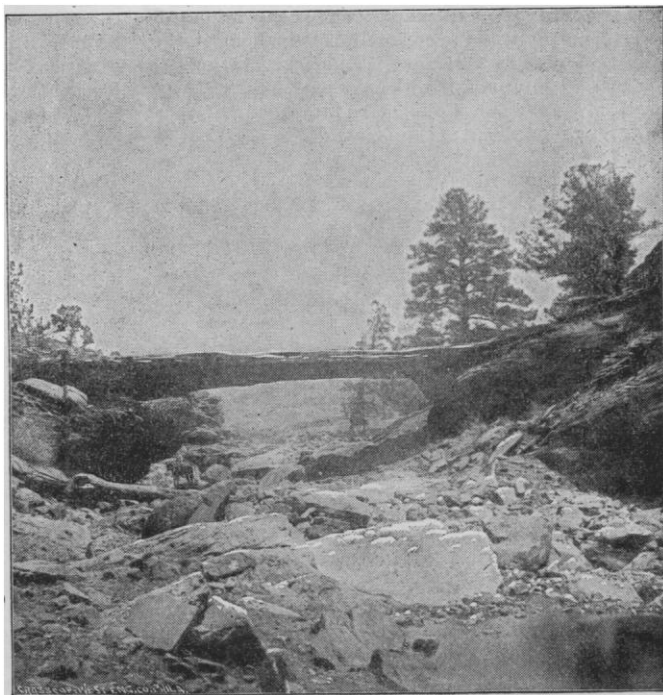
DURING a visit to Arizona, I came across a natural bridge, an account of which may be of interest in connection with recent notes on the Virginia bridge.

A long ridge, about six hundred or eight hundred feet high, extends for some distance north from a point near which the Atlantic and Pacific railroad crosses the boundary between New Mexico and Arizona. This ridge is formed by strata of dark-red sandstone under light-red, and is capped by a stratum of fine conglomerate or coarse grit. These strata are broken, and present an abrupt and generally perpendicular face to the west, sloping at an angle of  $14^{\circ}$  to the east, with the course of the stream, until they bury themselves below the alluvial sand. There are lower ridges, of corresponding structure, parallel to this on the east and west. This ridge is cut by deep and narrow cañons. At the mouth of one of these cañons, just before it dips under the sand, occurs this bridge. It is about twenty miles from the railroad, and, as far as I know, has never been visited by white men. I was guided to it by my Indian scout. The cañon extends west for about five miles above the bridge, and becomes deep, narrow, and wild; the sides, with their growth of hard-wood and pine, almost cutting off the light at mid-day.

The bridge is formed by a remnant of the overlying grit, which is continuous with it on both sides. The section cut through beneath it is of light and dark red sandstone, the former showing very pretty cross-bedding, and is non-conformable to the latter, which has much less dip. The bridge is sixty-five feet long, and fifteen feet wide at the narrowest point. It is two feet thick in the centre, and fifteen feet at the sides. The illustration, from a photograph taken at the time, will give a good idea of the position and proportions of the bridge; our ponies, standing underneath, serving for comparative measure. It will be seen that the cañon is wider for a short distance above the bridge, which may be due to a tributary cañon at that point.

It is difficult to give an explanation of this curious phenomenon; and I shall only suggest

a possibility, in the hope that some one will find time to investigate it more thoroughly. If above the present grit there had been soft strata, capped again by grit, it might be explained on the principle of the Swiss pot-holes; a waterfall being formed above, which wore a hole through the lower grit, and so undermined it, and cut out the sandstone beneath, as at Trumelbach. But the grit has every appearance of being a continuous cap over the ridge. The grit shows, however, evidence of an inclination to break into blocks; and it may be that a large crack, thus formed to



the west of the present bridge, allowed the stream to reach the soft sandstone, and so cut it away beneath.

A short distance off is another curious but not so uncommon phenomenon, — a 'petrified forest.' The stone tree-trunks lie just beneath the soil, or half exposed, fallen in all directions. I procured specimens which showed the bark, knots, roots, and branches. The radiate arrangement of the wood-cells was very evident in some cases. There are a number of these 'petrified forests' in Arizona, I was told. I know only of one other on the Navajo reservation, and one near Flagstaff.

FREDERICK GARDINER, Jun.